



A.D. 1861, *6th SEPTEMBER.* N° 2229.

S P E C I F I C A T I O N

OF

CHARLES FELTON KIRKMAN.

OBTAINING MANURE FROM SEWAGE.

LONDON:

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A.D. 1861, 6th SEPTEMBER. N° 2229.

Obtaining Manure from Sewage.

LETTERS PATENT to Charles Felton Kirkman, of Palace New Road, Lambeth, for the Invention of "IMPROVEMENTS IN OBTAINING MANURE FROM SEWERAGE, AND IN THE APPARATUS EMPLOYED THEREIN."

Sealed the 4th March 1862, and dated the 6th September 1861.

PROVISIONAL SPECIFICATION left by the said Charles Felton Kirkman at the Office of the Commissioners of Patents, with his Petition, on the 6th September 1861.

I, CHARLES FELTON KIRKMAN, of Palace New Road, Lambeth, do hereby
5 declare the nature of the Invention for "IMPROVEMENTS IN OBTAINING MANURE FROM SEWERAGE, AND IN THE APPARATUS EMPLOYED THEREIN," to be as follows:—

This Invention has for its object improvements in obtaining manure from sewerage, and in the apparatus employed therein; for these purposes the sewerage coming from a sewer is caused to flow or spread over an extended
10 surface, so that the depth shall be comparatively small and the flow sluggish. The surface over which the waters from the sewer are caused to spread is divided into several sections, and each section is formed with longitudinal gutters, along which the waters from the sewer flow, and deposit any grit or heavy matters in the gutters; provision is made for changing the section or
15 sections from time to time, in order that the section or sections which have become charged with sand, grit, or heavy matters may be cleansed or emptied previous to being again used. The waters flow from the section or sections into one of a series of tanks or reservoirs where any deodorizing materials

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which are employed are applied to them. From this reservoir or tank the waters flow by a syphon into another and deeper tank or reservoir. The first-mentioned tanks are used in succession, and the waters flow into them in succession, and do not flow therefrom till the water level rises above the bend of the syphon, and then they flow therefrom into the deeper tank till the first-mentioned are empty. The waters are then raised or pumped out of the deeper tank or reservoir, and distributed over a series of trays or shallow vessels, the flow of the waters in these trays being very slow or sluggish. In these trays the valuable matters are deposited from the waters. The bottoms of these trays are of sandstone or of other suitable porous or permeable matter, 10 so that filtration may take place through them. The deposited matters, after the flow of the waters has been diverted into and over other similar trays, is allowed to dry, and the drying is facilitated by dusting over them boghead coke or burned clay or gypsum, or other dryers which are suitable to be thrown on to land; and in order to prevent the matters deposited from the waters 15 adhering to the trays, they are first dusted over with dry burned clay or gypsum, or other matters suitable for making manure. The deposited matters in the tray after a time are to be cut or divided into pieces, which are to be turned over or raised on edge to facilitate their being well dried. The waters passing over the trays then flow into filter beds of burned clay or gypsum, or other matters 20 suitable for producing manure by absorbing the fertilizing matter in solution in the waters. It is preferred that these filters should be so formed as to cause the waters alternately to descend through and then to rise up through the filtering materials used.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed 25 by the said Charles Felton Kirkman in the Great Seal Patent Office on the 6th March 1862.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, CHARLES FELTON KIRKMAN, of Palace New Road, Lambeth, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters 30 Patent, bearing date the Sixth day of September, in the year of our Lord One thousand eight hundred and sixty-one, in the twenty-fifth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Charles Felton Kirkman, Her special licence that I, the said Charles Felton Kirkman, my executors, administrators, and assigns, or such others as I, 35 the said Charles Felton Kirkman, my executors, administrators, and assigns,

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should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for
5 "IMPROVEMENTS IN OBTAINING MANURE FROM SEWERAGE, AND IN THE APPARATUS EMPLOYED THEREIN," upon the condition (amongst others) that I, the said Charles Felton Kirkman, my executors or administrators, by an instrument in writing under my, or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said Invention, and in
10 what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said Charles Felton Kirkman, do hereby declare the nature of the said Invention, and in what manner the same is to
15 be performed, to be particularly described and ascertained in and by the following statement thereof, that is to say:—

This Invention has for its object improvements in obtaining manure from sewerage, and in the apparatus employed therein.

DESCRIPTION OF THE DRAWINGS.

20 Figure 1 shows a plan of apparatus arranged according to the Invention; Figure 2 shows a longitudinal section; Figure 3, a transverse section taken at A, B, in Figure 1; and Figure 4, a transverse section taken at C, D, in Figure 1. In these Figures the same letters of reference are used to indicate the same parts.

25 For these purposes, the sewerage or sewage coming from a sewer is caused to flow or spread over an extended surface, so that the depth shall be comparatively small and the flow sluggish. The sewerage or sewage is first received into the gutter *e, e*, out of which there are openings at *f, f*, each capable of being closed by a slide or gate *g*, so that the waters coming from a
30 sewer may be divided into several streams, as will readily be understood by reference to the Drawings. The surface over which the waters from the sewer are caused to spread is divided into several sections *h, h, h*, and each section is formed with longitudinal gutters *i, i, i*, along which the waters from the sewer flow, and deposit any grit or heavy matters in the gutters. Provision is made
35 as before mentioned, by means of the slides or gates *g, g*, for changing the section or sections from time to time in order that the section or sections which have become charged with sand, grit, or heavy matters may be cleansed or emptied previous to being again used. The waters flow from the section or

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sections composed of longitudinal gutters i, i , into one of a series of tanks or reservoirs k, k , by means of the descending passages j, j , at the ends of the first sections i, i , into a transverse pipe j^1 below, and thence through branch pipes j^2 into one of the tanks or reservoirs k, k , where any deodorizing materials which are employed are applied to them, such deodorizing materials being prepared 5 in one of the tubs l , or other suitable vessel, and from thence supplied to the tanks or reservoirs k , into which it is allowed to flow, and such deodorizing matters are well stirred into the waters received into the reservoirs or tanks k, k . From one of these reservoirs or tanks k , the waters flow by a syphon m into another and deeper tank or reservoir n . The first-mentioned tanks k, k , are 10 used in succession, and the waters flow into them in succession, and do not flow therefrom till the water level rises above the bend of the syphon, and then they flow therefrom into the deeper tank n , till the first-mentioned reservoirs k are empty. The waters are then raised or pumped out of the deeper tank or reservoir, and distributed over a series of trays or shallow vats o, o , the flow of 15 the waters in these trays being very slow or sluggish. In order that these shallow vessels may be used separately, the waters from the tank n are pumped into a gutter or trough o^1 , from which there are separate passages o^2 with slides or gates o^3 . In these trays, and in the similar trays p, p , the valuable matters are deposited from the waters. The bottoms of these trays are of sandstone 20 or of other suitable porous or permeable matters, so that filtration may take place through them.

In the Drawings, the bottoms of the shallow trays or vessels o, o , and p, p , are shewn to be covered with porous tiles resting on uprights o^4, o^4 , at their angles, leaving a space o^5 below the tiles, and the water from below the tiles is 25 collected by a pipe o^6 , from whence it passes by a pipe or pipes to the drain q , which also receives the filtered water from under the trays p, p , the drain q conducts such filtered water to any place where it may be required.

I would state, that the mode of forming the bottoms of these and the other similar trays may be varied, but it is desirable that they should be porous. 30 The deposited matters, after the flow of the waters has been diverted into and over trays o, o , and p, p , is allowed to dry, and the drying is facilitated by dusting over the deposited matters in them boghead coke or burned clay or gypsum, or other dryers which are suitable to be thrown on to land. And in order to prevent the matters deposited from the waters adhering to the trays 35 they are first dusted over with dry burned clay or gypsum, or other matters suitable for making manure. The deposited matters in the trays after a time are to be cut or divided into pieces, which are to be turned over or raised on edge to facilitate their being well dried. The waters passing over the trays o, o ,

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and p, p , then flow into filter beds r, r , of burned clay or gypsum, or other matters suitable for producing manure by absorbing the fertilizing matter in solution in the waters. It is preferred that these filters should be so formed as to cause the waters alternately to descend through and then to rise up
5 through the filtering materials used. It is preferred that these filter beds should be formed in tanks or vessels divided by partitions r^1 and r^2 , so arranged that when filled up with burned clay or gypsum or other matters, the sewerage waters shall be caused to pass through such materials, and alternately under the partitions r^1 , and over the partitions r^2 , by which the sewage after having
10 deposited in the trays o, o , and p, p , much or all of the matters held in suspension will, by being filtered through the materials in the filter beds r , be deprived of the remaining manuring or fertilizing matters held in solution. The apparatus above described is shewn to be arranged to suit land where there is not a sufficient fall between the successive parts of the apparatus to avoid the
15 necessity of pumping the sewage after being mixed with the deodorizing matters; but it will be evident, that where the land falls, as on the side of a hill or otherwise, and the depositing trays can be arranged with convenience to flow into the trays o, o , from the tanks or reservoirs, the expence of pumping may be dispensed with.

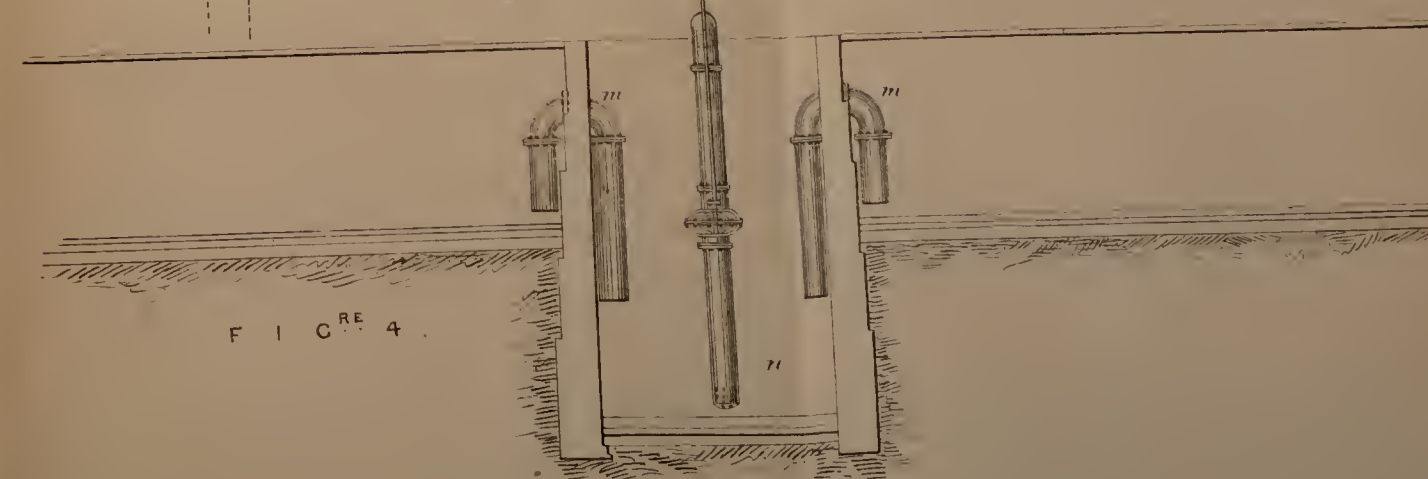
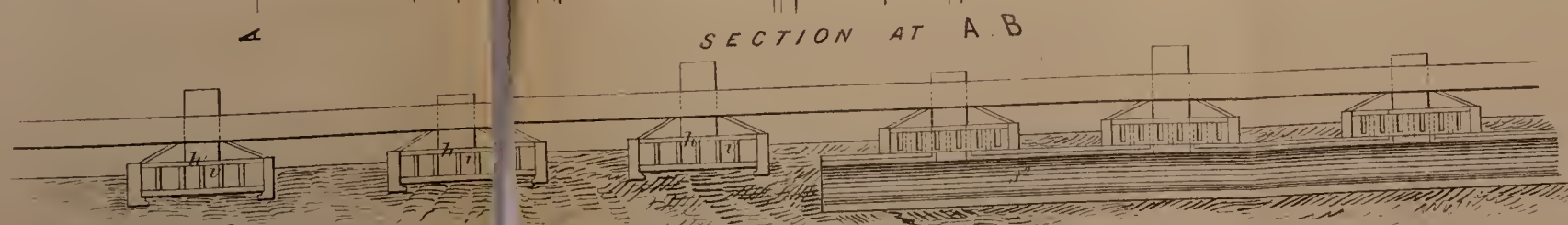
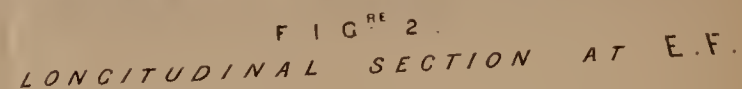
20 Having thus described the nature of my Invention, and the manner of performing the same, I would have it understood that what I claim is the apparatus and process herein described for obtaining manure from sewage or waters coming from sewerage works of cities, towns, and other places.

In witness whereof, I, the said Charles Felton Kirkman, have hereunto
25 set my hand and seal, this Fifth day of March, in the year of our Lord One thousand eight hundred and sixty-two.

CHARLES F. KIRKMAN. (L.S.)

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